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EXAMINER	
NGUYEN, HIEP	

ART UNIT	PAPER NUMBER
2816	

DATE MAILED: 01/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/683,552	STYDUHAR, MARK S.	
	Examiner	Art Unit	
	Hiep Nguyen	2816	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 April 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The amendment filed on 04-08-04 has been received and entered in the case. New ground of rejections necessitated by the amendment is set forth below.

Drawings

The drawings are objected to because the drawings filed on 04-08-04 are not readable. The connection in figures 3 and 5 are not complete. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities: in the specification, page 3, third paragraph, the disclosure "wherein the rise in the input signal switches the tail current source on" is misleading because according to figure 1 of the present application, the tail current source (T1) is a PMOS transistor. When the input signal (COMPIN) starts rise from ground level, the voltage at the gate rises thus, the tail current source is turned off gradually until the difference voltage between Vcc

and the voltage at the gate of the tail current source is smaller than the threshold of the tail current source transistor, the tail current source transistor is switched off.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 21-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Correction and/or clarification is required.

Regarding claims 21 and 29, the recitation "whereby said input signal rises from toward a positive power supply voltage, and whereby the rise in said input signal switches the tail current source transistor on" is indefinite because it is misdescriptive. According to figure 1 of the present application, the tail current source (T1) is a PMOS transistor. When the input signal (COMPIN) starts rise from ground level, the voltage at the gate of transistor (T1) rises thus, transistor (T1) is turned off gradually until the difference voltage between Vcc and the voltage at the gate of transistor (T1) is smaller than the threshold of transistor (T1), transistor (T1) is switched off.

Regarding claim 25, the recitation "wherein as said input signal decreases, a switching threshold becomes dependent on said width-to-length ratio" is indefinite because it is misdescriptive. The trip point of a comparator depends on the W/L ratio of the transistors. When the input signal exceeds the threshold defined by the W/L ratio, the output of the comparator changes state. The increasing/decreasing of the input signal has no effect on a predetermined value W/L ratio of a transistor as recited.

Regarding claim 35, the recitation "A comparator set to has a pair of trip points corresponding to a rising and falling edge of an input signal" is indefinite because it is misdescriptive. The trip points of a comparator depend of the W/L ratio of the components and the level of the reference voltage. The trip point is not set corresponding to a rising and falling edge of an input signal as recited.

Claims 22-24, 26-28, 30-34 and 36-40 are indefinite because of the technical deficiencies of claims 21, 29 and 35.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 21-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuo (US Pat. 5,483,184) in view of Lim et al.(US Pat. 5,247,299).

Regarding claims 21-24, figure 3 of Kuo shows a comparator cycling between an analog configuration and a digital configuration comprising: two input transistors (M1) and (M2), a tail current source transistor (M3) having a gate connected to the gate of the input transistor (M1). Figure 3 of Kuo does not show a plurality of transmission gates connected to theses transistors. Figure 3 of Lim shows a comparator circuit having transmission gates connected to the transistors of the circuit for providing selective coupling or decoupling the signals to the inputs of the circuit (col. 4, lines 52-60). Therefore, it would have been obvious to those skilled in the art to implement the pass-gates to the transistors of the circuit for providing selective coupling or decoupling the signals to the inputs of the circuit. Because the combination of the circuit of Kuo and Lim and the claimed circuit (fig. 1) of the present application are identical, they are capable to perform a same function. The first trip point depends on the value of the reference voltage (Vref) and the second trip point associated with the falling edge of the input signal depends on the W/L ratio of the transistors. When the input voltage starts to rise, the comparator is in the analog configuration until the level of the input voltage is higher than the level of the reference voltage, the output of the comparator changes state from low to high or from high to low. At this stage, the comparator is in the digital configuration. The rise of the input signal switches the tail current source transistor (M3) on. Depending on the level of the reference voltage, especially when the reference voltage is selected to be low,

the majority of a cycle time of the comparator is in the digital configuration. When the input signal starts to rise, the input signal causes the comparator to appear as a differential pair in an open loop configuration.

It is inherent that the every comparator performs with hysteresis (or Schmitt trigger) feature. When the W/L of the transistors are not equal, the asymetric Schmitt trigger happens.

Regarding claims 25-27, the transistors comprise:

a first transistor of length (Lx) and a width of (Wx); and

a second transistor of 1ength (Ly) and a width of (Wy),

wherein said width-to length ratio equals (Wx Vy)/(Wy Lx), and

The level of the input signal that causes the output of the comparator to change state depends on the width-to-length ratio and the first or second trip point can be changed by varying the W/L ratios.

Regarding claim 28, if the trip point and the reference voltage are selected to be low, it is inherent that the time the comparator is in the digital configuration can be large (80% or more of the cycle time).

Regarding claims, 29-34, because of the similarity of these claims with claims 21, 25, 22, 23, 24 and 28; these claims are also unpatentable over Kuo (US Pat. 5,483,184) in view of Lim et al. (US Pat. 5,247,299).

Regarding claims 35, 36 and 37, figure 3 of Kuo shows a comparator having trip points set corresponding to the W/L ratio of the components (transistors) of the circuit and the reference voltage (Vref). Because the difference of the W/L ratios of the transistors of the circuit and the value of the reference voltage (external "trip point"), the "delay between the rising and falling edge transitions at an output signal of the comparator can be adjusted accordingly. If the levels of the reference voltage is set to be low , the majority of the cycle time will be the digital configuration. The elements of the circuit of claim 36 are clearly shown in figure 3 of Kuo. The current mirror in claim 37 comprises transistors (M4) and (M5).

Regarding claims 38-40, when the input voltage start to rise from ground level, the comparator in the analog configuration. The input signal also turns the current

source transistor (M3) on. When the input voltage is higher than the reference voltage, the output of the comparator changes state and the comparator is in the digital configuration. Depending on the level of the reference voltage, the cycle time of the digital configuration can be at a desired percentage.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references are cited as of interest because it shows some common-mode detection circuit analogous to the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Hiep Nguyen whose telephone number is (703) 305-0127. The examiner can normally be reached on Monday to Friday from 7:30 A.M. to 4:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Callahan, can be reached on (703) 308-4876. The fax phone number for this Group is (703) 308-6251.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

Hiep Nguyen

12-22-04

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